

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for processing a film over a substrate in a process chamber, the method comprising:

flowing a process gas suitable for processing the film over the substrate into the process chamber in accordance with a predetermined algorithm specifying process conditions;
monitoring a parameter during processing of the film over a thickness greater than 3 μm ; and

changing the process conditions ~~in accordance with a correlation among a value of the parameter, an~~ in response to a measured optical property of the film, ~~and the process conditions wherein changing the process conditions comprises increasing,~~ discretely, an RF source power.

2. (Original) The method recited in claim 1 further comprising forming a plasma in the process chamber from the process gas.

3. (Original) The method recited in claim 1 wherein monitoring the parameter comprises monitoring the parameter during processing of the film over a thickness greater than 5 μm .

4. (Original) The method recited in claim 1 wherein the predetermined algorithm is optimized to control a vertical profile of the film.

5. (Original) The method recited in claim 1 wherein the predetermined algorithm is optimized to control a horizontal profile of the film.

6. (Original) The method recited in claim 1 wherein changing the process conditions is performed in response to a change in the parameter.

7. (Original) The method recited in claim 1 wherein the parameter comprises a process parameter.

8. (Original) The method recited in claim 1 wherein the parameter comprises a film-property parameter.

9. (Original) The method recited in claim 8 wherein the parameter comprises a reflectometry measurement.

10. (Original) The method recited in claim 8 wherein the parameter comprises an ellipsometry measurement.

11. (Original) The method recited in claim 1 wherein the parameter comprises a stress uniformity of the film.

12. - 14. (Canceled)

15. (Original) The method recited in claim 1 wherein changing the process conditions is performed to maintain a substantially constant value for the optical property of the film throughout processing the film.

16. (Original) The method recited in claim 1 wherein changing the process conditions is performed to deposit the film with a desired variation in the optical property of the film throughout processing the film.

17. (Original) The method recited in claim 1 wherein the process gas comprises a silicon-containing gas and an oxygen-containing gas.

18. (Original) The method recited in claim 1 wherein processing the film comprises depositing the film.

19. (Original) The method recited in claim 1 wherein processing the film comprises etching the film.

20. (Original) The method recited in claim 1 further comprising annealing the film.

21. (Currently Amended) A method for forming an optical waveguide over a substrate in a process chamber, the method comprising:

forming a plasma in the process chamber;

flowing a silicon-containing gas and an oxygen-containing gas into the process chamber in accordance with a predetermined algorithm specifying process conditions to deposit a film over the substrate;

monitoring a refractive-index value of the film during deposition of the film over a thickness greater than 3 μm ; and

changing the process conditions in accordance with a correlation between the refractive-index value and the process conditions, **wherein changing the process conditions comprises increasing an RF source power, continuously, for maintaining the plasma.**

22. (Original) The method recited in claim 21 wherein monitoring the refractive-index value comprises monitoring the refractive-index value of the film during deposition of the film over a thickness greater than 5 μm .

23. (Original) The method recited in claim 21 wherein the predetermined algorithm is optimized to control a vertical profile of the film.

24. (Original) The method recited in claim 21 wherein the predetermined algorithm is optimized to control a horizontal profile of the film.

25. - 27. (Canceled)

28. (Original) The method recited in claim 21 wherein changing the process conditions is performed to maintain a substantially constant value for the refractive-index value throughout the deposition.

29. (Original) The method recited in claim 21 wherein changing the process conditions is performed to deposit the film with a desired variation in the refractive-index value throughout the deposition.

30. - 32. (Canceled)

33. (Original) The method recited in claim 21 further comprising annealing the film.

34. (Withdrawn) A thick-film processing system comprising:
a housing defining a process chamber;
a plasma-generating system operatively coupled to the process chamber;
a substrate holder configured to hold a substrate during substrate processing;
a gas-delivery system configured to introduce gases into the process chamber;
a pressure-control system for maintaining a selected pressure within the process chamber;
a sensor disposed to monitor a parameter during processing within the process chamber;
a controller for controlling the plasma-generating system, the gas-delivery system, the sensor, and the pressure-control system; and
a memory coupled with the controller, the memory comprising a computer-readable medium having a computer-readable program embodied therein for directing operation of the thick-film processing system, the computer-readable program including:
instructions to control the plasma-generating system to form a plasma in the process chamber;

instructions to control the gas-delivery system to flow a process gas suitable for depositing the film over the substrate in accordance with a predetermined algorithm specifying process conditions;

instructions to control the sensor to monitor the parameter during processing of the film over a thickness greater than $3\text{ }\mu\text{m}$; and

instructions to change the process conditions in accordance with a correlation among a value of the parameter, an optical property of the film, and the process conditions.

35. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for monitoring the parameter comprise instructions for monitoring the parameter over a thickness greater than $5\text{ }\mu\text{m}$.

36. (Withdrawn) The thick-film processing system recited in claim 34 wherein the predetermined algorithm is optimized to control a vertical profile of the film.

37. (Withdrawn) The thick-film processing system recited in claim 34 wherein the predetermined algorithm is optimized to control a horizontal profile of the film.

38. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions to change the process conditions are executed in response to a change in the parameter.

39. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor comprises a reflectometer.

40. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor comprises an ellipsometer.

41. (Withdrawn) The thick-film processing system recited in claim 34 wherein the sensor is configured to measure a stress of the film.

42. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for changing the process conditions are executed to maintain a substantially constant value for the optical property of the film throughout depositing the film.

43. (Withdrawn) The thick-film processing system recited in claim 34 wherein the instructions for changing the process conditions are executed to deposit the film with a desired variation in the optical property of the film.